

**Renewable Energy Plan
2013 Biennial Review
Lansing Board of Water & Light
MSCP Case No. U-16619**

This Biennial Review filing by the Lansing Board of Water & Light (LBWL) complies with State of Michigan Public Act 295 of 2008 (the Act) and the related December 6, 2012 Michigan Public Service Commission Order (MPSC Case No. U-16619).

Part (4) of Section 25 provides that every two years after initial approval of the REP the MPSC shall review the REP after providing an opportunity for public comment (the provider itself can instead provide the opportunity for public comment).

An opportunity to convey public comments on the LBWL Renewable Energy Plan Biennial Review was communicated to all LBWL customers on its website, www.lbwl.com. The LBWL will solicit public comments until July 26, 2013 in three ways: 1) via the website, www.lbwl.com; 2) by mail: Lansing Board of Water & Light, 1232 Haco Drive, Lansing, MI 48901; and 3) in person by appointment with George Stojic, Executive Director of Strategic Planning and Development, July 15-19th, 2013. All public comments received on the REP Biennial Review will be submitted to the MPSC prior to August 30, 2013.

The LBWL filed a 20-year Renewable Energy Plan (U-15868) with the MPSC on March 31, 2009 as required by PA 295; and on July 1, 2009, the MPSC issued an order finding that the LBWL's plan complies with PA 295. In addition, the LBWL filed its' first Biennial REP Review on July 1, 2011; and on October 4, 2011 the MPSC issued an order finding that the LBWL's plan complies with PA 295. The LBWL does not plan any major amendments to the REP filed on March 29, 2009 and this biennial review is only to provide progress made to date and an updated financial analysis.

Section 25 (2) (a) “Describe how the provider will meet the renewable energy standards”

The LBWL developed a two phase approach to meeting the standards. Phase I addresses the compliance years 2012 through 2015 and Phase II addresses the years running from 2016 to 2028.

Phase I - In 2007, prior to enactment of PA 295 in October of 2008, the LBWL adopted its own Renewable Portfolio Standard (RPS). The LBWL's RPS called for acquiring renewable energy beginning in 2009. Compliance with Phase I of the Act is based on the renewable energy the LBWL began to secure during 2007 and 2008, to comply with its own RPS. Phase I renewable energy sources include two hydro units, two landfill gas facilities and a solar energy facility located in Lansing. “Banked” Renewable Energy Credits (RECs) from these existing renewable energy sources for the years 2009 to 2012 (in accordance with Section 29 (3) (c) of PA295), when combined with their expected generation, including capacity additions, during the Phase I years of 2012 to 2014 provides the LBWL with an inventory of RECs sufficient to allow the LBWL to meet the PA 295 standards through 2015. See *Attachment A – Renewable Energy Credit Portfolio* for further details.

Update: The table below summarizes the status of the megawatt hours (MWh) and Renewable Energy Credits (RECs) that the LBWL has acquired and/or generated in 2011 and 2012. The LBWL will continue “banking” the RECs which will be used together with RECs from ongoing generation to meet the PA 295 standards through 2015.

	Electricity	Renewable Energy Generated or Acquired Including Michigan Incentive RECs
Year	MWh	RECs
2011	87,676	98,514
2012	84,777	92,831

Compliance reporting for renewable energy started in 2012 and the LBWL applied 48,319 renewable energy credits to meet the requirements under PA 295.

Phase II - Beginning no later than 2015, the LBWL will add to its renewable energy sources to ensure compliance with PA 295 renewable energy portfolio requirements. To continue diversifying its renewable energy portfolio, the LBWL currently plans to add approximately 20 MW of additional wind and solar projects near the Lansing area. These projects are forecasted to generate approximately 63,100 MWh of electricity annually. In total, the LBWL anticipates producing approximately 60,000 MWh’s of additional renewable energy in 2015 from other renewable energy sources and/or purchase of renewable energy credits.

Section 25 (2) (b) “Specify whether the number of megawatt hours of electricity used in the calculation of the renewable energy credit portfolio will be weather-normalized or based on the average number of megawatt hours of electricity sold by the electric provider annually during the previous 3 years to retail customers in this state. ”

The LBWL has calculated its renewable energy credit portfolio requirements based on the average number of MWhs of electricity sold by the LBWL annually during the three previous years to its retail customers in the state. This is consistent with the LBWL original U-15868 plan filing.

Section 25 (2) (c) “Include the expected incremental cost of compliance with the renewable energy standards.”

Following the *Filing Requirements and Instructions for Renewable Energy Plans for Municipally-Owned Electric Utilities* provided in Attachment C of the MPSC Order to implement PA 295, the LBWL has provided *Attachment B – Renewable Energy Plan Surcharge Summary*. In summary, the incremental cost of compliance is estimated to be less than the Section 45 (2) caps of \$3.00 per month for each residential meter, \$16.58 per month for each commercial meter, and \$187.50 for each industrial meter. The actual incremental costs, levelized pursuant to Section 45 (4), shall be detailed on customer’s bills per Section 45 (5) beginning when the Renewable Energy Plan is approved by the Commission.

The incremental costs were calculated in the following manner:

(1) Total renewable costs are calculated from the terms of power purchase agreements, and forecast costs of future solar, wind, and hydro installations. Where appropriate, these costs are escalated over time.

(2) Incremental renewable costs are offset by either a long-term forecast of market energy, capacity and REC (for excess RECs) prices, or the all-in cost of generation from the LBWL's own generating units. The forecast market prices are based upon estimated MISO wholesale market prices and come from an energy modeling and consulting firm, Ventyx. These estimates span the period of time beginning with 2013 and running to 2028 and begin at approximately \$34/MWh in 2013 and escalate to \$48/MWh in 2028. Capacity costs are not material in 2013 but increase to \$84.03 /Kw/year by 2028. The forecast market prices are used to determine the incremental cost of renewable energy resources outside the Lansing footprint. The incremental cost of power for renewables within the footprint are the all-in, capacity and energy costs, of energy displaced from the BWL's own generating units. Renewable energy within the LBWL's service territory serves the same role as LBWL generation in offsetting transmission requirements and reducing day-ahead load forecasts.

(3) The difference between the renewable energy cost and the offsetting market value of energy and capacity is the estimated incremental cost of renewable energy.

(4) Incremental costs are summed for all the renewable energy sources for each year. The sums are offset in years 2012-2013 by the sale of excess REC's. The annual net sums are then present valued and this amount is used to calculate a levelized monthly charge for each customer class over a twenty year period

Section 25 (2) (d) “Describe the manner in which the provider will allocate costs”

Except for its secondary commercial and industrial customers, the LBWL intends to allocate costs on a per meter, per month basis. The LBWL's secondary rates 3, 4, and rate 12 contain commercial customers with a very wide variation of monthly energy consumption amounts. A flat fee could cause monthly increases of 80% or more for some of these customers. In order to mitigate potential rate impacts, customers on these rates will be charged a two part rate. First, a flat monthly amount of \$3.50 will be charged to these customers and, second, a KWh charge will be levied until the cap is reached.

Residential customers will be charged a flat rate of \$2.50, except for senior customers on the LBWL's senior rate. Senior customers on rate 21 will be charged \$1.25 per month. The remaining customers will be charged the rate rates shown in Attachment B lines 52 through 61.

Update: The LBWL began levying these surcharges in March of 2010, and plans to evaluate these surcharges in the fall of 2013 and make revisions as needed. This is consistent with the Renewable Energy Plan (U-15868) filed by the LBWL which the MPSC found to be in compliance with PA 295.

Attachment A – Renewable Energy Credit Portfolio shows the existing Renewable Energy Sources

LBWL Moores Park Hydro, South Unit – This hydro-electric unit, owned by the LBWL, was rehabilitated and brought back into service in March 2008. The unit is capable of approximately 0.5 MW gross generating capacity. This unit typically generates approximately 1,100 MWh’s annually.

Granger Landfill Energy, Wood Road – This facility, under a long term Power Purchase Agreement (PPA) with the LBWL, was interconnected directly to the LBWL distribution system and began commercial operation in November 2008. We anticipate this facility to generate approximately 53,000 MWh’s for 2013 through 2023. In 2024, we expect the facility to begin generating 9.0 MW of energy (75,000 MWh’s).

Granger Landfill Energy, Grand River – This facility, also under a long term PPA with the LBWL, will add another approximately 26,000 MWh’s of renewable energy to the LBWL system beginning in March 2009.

Tower/Kleber Hydro – This northern Michigan hydro-electric unit (near Cheboygan) with a gross generating capacity of 1.7 MW is also under a PPA with the LBWL. This facility will provide approximately 5,700 MWh’s annually.

LBWL Cedar Street Solar Array

This downtown Lansing solar array, brought online in December 2008, consists of 432 solar panels with 54 kW of gross generating capacity. Estimated annual output is approximately 65 MWh’s. The solar panels are expected to remain operational over the entire 20 year period included in PA 295.

Summary:

As seen in the table *Existing Renewable Energy Sources* below, the LBWL forecast these sources to provide approximately 93,000 RECs in 2012 and continue at this level. The total amount of generation from these sources for the one year prior to enactment of PA 295 was approximately 6,655 MWh’s. The following table details the electricity and IRECs generated from the existing renewable energy facilities:

Existing Renewable Energy Sources

Source	Capacity MW	MWh Generated 2011	IRECs 2011	MWh Generated 2012	IRECs 2012
Tower Kleber	1.7	5,676	523	5,793	549
Granger Wood Rd	6	53,991	7,580	52,814	4,915
Granger Grand River	3	27,734	2,586	26,105	2,450
Moores Park Hydro	0.5	220	20	0	0
Cedar Solar Array	0.054	55	129	65	140
	11.25	87,676	10,838	84,777	8,054

Attachment B – Renewable Energy Plan Surcharge Summary

Please find below a detailed description of the rows in the Attachment B worksheet.

Row 4 – Actual and forecasted retail Sales.

Row 6 – Number of renewable energy credits required based on three year average annual sales for preceding three year period (PA 295 section 27 (3). The annual requirement is phased in between 2012 and 2015 and then remains constant after 2015.

Row 8 – Renewable energy credits required for compliance. Same number as in Row 6, but expressed in REC's instead of MWhs.

Row 9 – RECs from existing renewable energy supply (pre-PA 295).

Row 10- Required RECs for compliance each year.

Row 13 – The number of REC's to be acquired by the end of that year.

Row 14 – The number of REC's the LBWL's renewable energy plan identifies to be acquired through new resources (new solar and wind projects) by the end of that year.

Row 15 – The annual excess or deficient number of REC's.

Row 16 – Percentage of the required REC's the LBWL has acquired by the end of the year.

Row 17 – The cumulative number of excess REC's for the three previous years available for carryover.

Row 40 - Cost of Renewable Energy Construction, O&M, and Purchased Power

Row 43 - Market Value of Energy and Capacity.

Row 44 – Sale of REC's.

Row 45 – Incremental costs of compliance.

Row 47 thru 52 – Total meters, customers, or installations forecast for each rate class.

Row 53 thru 57 – Calculations using Maximum Surcharge (all rate classes at caps).

Row 58 thru 62 – Total Planned Surcharges for each rate class.

Attachment A - Renewable Energy Credit Portfolio

Line	(a)	(b)	(c)	(d)	(e)	(f)	(g) = (e) + (f)	(h)	(i) = (d) - (g) - (h) + Prior Yr (i)	Renewable Energy Sources						
	Year	REC Portfolio Standard	Total REC Compliance Obligation	RECs from Current Year	RECs Used from Current Year	RECs Used from Bank	Total RECs Used for Compliance	Total RECs Sold (or lost)	Cumulative RECs Banked and Carried Over to Next Year	Granger	Tower Kleber	BWL Solar	BWL Hydro	Wind	Other	Total
1	2009	0.00%	0	90,819	0	0	0	0	90,819	82,066	7,273	210	1,283			90,832
2	2010	0.00%	0	95,367	0	0	0	0	186,186	87,939	6,086	197	1,155			95,377
3	2011	0.00%	0	98,514	0	0	0	0	284,700	91,891	6,199	184	240			98,514
4	2012	2.25%	48,316	92,831	0	48,316	48,316	42,503	286,711	86,284	6,342	205	0			92,831
5	2013	3.50%	76,733	87,451	0	76,733	76,733	18,634	278,795	79,737	6,192	211	1,312	0	0	87,451
6	2014	5.15%	112,509	91,486	-1,475	113,984	112,509	2,200	254,097	79,820	6,226	4,128	1,312	0	0	91,486
7	2015	10.00%	216,412	217,071	-7,269	223,680	216,412	2,200	245,288	79,820	6,231	4,128	1,312	65,580	60,000	217,071
8	2016	10.00%	216,412	217,056	-7,269	223,680	216,412	2,200	236,464	79,820	6,216	4,128	1,312	65,580	60,000	217,056
9	2017	10.00%	216,412	217,065	221,968	1,713	223,680	2,200	449,615	79,820	6,225	4,128	1,312	65,580	60,000	217,065
10	2018	10.00%	216,412	217,064	222,081	1,599	223,680	2,200	662,880	79,820	6,224	4,128	1,312	65,580	60,000	217,064
11	2019	10.00%	216,412	217,061	222,196	1,484	223,680	2,200	876,257	79,820	6,222	4,128	1,312	65,580	60,000	217,061
12	2020	10.00%	216,412	217,064	222,313	1,367	223,680	2,200	1,089,754	79,820	6,224	4,128	1,312	65,580	60,000	217,064
13	2021	10.00%	216,412	217,063	222,428	1,252	223,680	2,200	1,303,364	79,820	6,223	4,128	1,312	65,580	60,000	217,063
14	2022	10.00%	216,412	217,063	222,544	1,136	223,680	2,200	1,517,091	79,820	6,223	4,128	1,312	65,580	60,000	217,063
15	2023	10.00%	216,412	217,063	222,660	1,020	223,680	2,200	1,730,933	79,820	6,223	4,128	1,312	65,580	60,000	217,063
16	2024	10.00%	216,412	217,063	222,776	904	223,680	2,200	1,944,891	79,820	6,223	4,128	1,312	65,580	60,000	217,063
17	2025	10.00%	216,412	217,063	222,892	788	223,680	2,200	2,158,966	79,820	6,223	4,128	1,312	65,580	60,000	217,063
18	2026	10.00%	216,412	217,063	223,008	672	223,680	2,200	2,373,156	79,820	6,223	4,128	1,312	65,580	60,000	217,063
19	2027	10.00%	216,412	217,063	223,124	556	223,680	2,200	2,587,462	79,820	6,223	4,128	1,312	65,580	60,000	217,063
20	2028	10.00%	216,412	217,063	223,240	440	223,680	2,200	2,801,884	79,820	6,223	4,128	1,312	65,580	60,000	217,063
21	2029	10.00%	0	0	0	0	0	0	2,801,884							
22	Total		3,267,326	3,595,348		699,327	3,354,548	94,137								

Data above includes RECs and IRECs.

Attachment B - Renewable Energy Plan Surcharge

	Units	CY 2009	CY 2010	CY 2011	CY 2012	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024	CY 2025	CY 2026	CY 2027	CY 2028
Row 4 xxx Sales Forecast (xxx = 3 yr running average)	MWH	2,055,200	2,193,195	2,200,448	2,176,746	2,173,709	2,141,903	2,148,897													
Row 6 RPS Requirement (PA295 section 27(3))	MWH				2,149,615	2,190,130	2,183,634	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119
Row 8 RPS Required REC's (-) REC's fom Existing Renewable Energy Supply (Pre RPS)	RECs				2,149,615	2,190,130	2,183,634	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119	2,164,119
Row 9 RPS Required REC's	RECs				6,655	6,655	6,655	6,655	6,655	6,655	6,655	6,655	6,655	6,655	6,655	6,655	6,655	6,655	6,655	6,655	6,655
Row 10 RPS Renewable Energy Credit Compliance Required REC's	RECs				48,316	76,733	112,509	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412
Row 12 RPS Renewable Energy Credit Compliance Required REC's	RECs				48,316	76,733	112,509	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412	216,412
Row 13 REC's Obtained	RECs	90,819	95,367	98,514	92,831	87,451	91,486	217,071	217,056	217,065	217,064	217,061	217,064	217,063	217,063	217,063	217,063	217,063	217,063	217,063	217,063
Row 15 REC's Compliance Balance	RECs				44,515	10,718	-21,023	659	644	653	652	649	652	651	651	651	651	651	651	651	651
Row 16 REC's Compliance %	RECs				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Row 17 REC's Eligible for Carryover	RECs	90,819	95,367	98,514	92,831	87,451	91,486	217,071	217,056	217,065	217,064	217,061	217,064	217,063	217,063	217,063	217,063	217,063	217,063	217,063	217,063
Row 40 Cost of Renewable Energy Construction, O&M, and Purchased Power	\$	5,438,507	6,000,520	6,451,986	6,402,764	6,132,846	6,587,663	9,425,793	10,122,879	10,352,574	10,587,551	10,828,272	11,075,202	11,328,162	11,587,418	11,853,163	12,125,494	12,404,607	12,690,671	12,983,848	13,284,324
Row 43 Forecast Value of Energy and Capacity	\$					2,735,662	4,436,456	6,274,556	7,306,758	7,410,924	7,503,122	7,605,930	7,733,651	8,001,577	8,154,015	8,313,475	8,384,778	8,527,911	8,696,057	8,842,926	8,998,152
Row 44 Sale of REC's	\$																				
Row 45 Incremental Cost of Compliance Present Value	\$	1,325,052	1,868,974	1,203,486	2,623,402	1,868,974	2,151,207	3,151,238	2,816,122	2,941,650	3,084,428	3,222,342	3,341,551	3,326,585	3,433,402	3,539,687	3,740,716	3,876,695	3,994,614	4,140,922	4,286,171
Row 47 Non-Volumetric Surcharge																					
Row 48 Meter (or customer) Forecast																					
Residential																					
Residential			79,495	79,159	79,160	79,556	79,954	80,353	80,755	81,159	81,565	81,973	82,382	82,794	83,208	83,624	84,042	84,463	84,885	85,309	85,736
Senior Citizen Residential			3,061	3,200	3,296	3,312	3,329	3,346	3,362	3,379	3,396	3,413	3,430	3,447	3,465	3,482	3,499	3,517	3,534	3,552	3,570
Row 49 Total Residential			82,556	82,359	82,456	82,868	83,283	83,699	84,118	84,538	84,961	85,386	85,813	86,242	86,673	87,106	87,542	87,979	88,419	88,861	89,306
Secondary																					
Street Light Luminarie			34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000
Traffic Signal by Intersection			315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315
Secondary Commercial & Industrial			11,957	11,852	11,837	11,896	11,956	12,015	12,076	12,136	12,197	12,258	12,319	12,380	12,442	12,505	12,567	12,630	12,693	12,757	12,820
Row 50 Total Non-Metered & Secondary			46,272	46,167	46,152	46,211	46,271	46,330	46,391	46,451	46,512	46,573	46,634	46,695	46,757	46,820	46,882	46,945	47,008	47,072	47,135
Primary Metered			146	140	143	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142
Row 51 Total Primary			146	140	143	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142
Row 52 TOTAL Meter (or Customer) Forecast			128,974	128,666	128,751	129,221	129,695	130,171	130,650	131,131	131,614	132,100	132,588	133,079	133,572	134,068	134,566	135,066	135,569	136,075	136,583
Row 53 Maximum Surcharge (all rate classes at caps)																					
Row 54 Residential (\$3.00)	\$		2,972,016	2,964,924	2,968,416	2,983,258	2,998,174	3,013,165	3,028,231	3,043,372	3,058,589	3,073,882	3,089,251	3,104,698	3,120,221	3,135,822	3,151,501	3,167,259	3,183,095	3,199,011	3,215,006
Row 55 Secondary (\$16.58)	\$		9,206,277	9,185,386	9,182,402	9,194,177	9,206,012	9,217,905	9,229,858	9,241,871	9,253,944	9,266,077	9,278,271	9,290,525	9,302,842	9,315,219	9,327,659	9,340,160	9,352,725	9,365,352	9,378,042
Row 56 Primary (\$187.50)	\$		328,500	315,000	321,750	319,500	319,500	319,500	319,500	319,500	319,500	319,500	319,500	319,500	319,500	319,500	319,500	319,500	319,500	319,500	319,500
Row 57 Total Recovered at Maximum Surcharge	\$Mill	\$0.0	\$12.5	\$12.5	\$12.5	\$12.5	\$12.5	\$12.6	\$12.6	\$12.6	\$12.6	\$12.7	\$12.7	\$12.7	\$12.7	\$12.8	\$12.8	\$12.8	\$12.9	\$12.9	\$12.9
Row 58 Total Planned Surcharge																					
Residential																					
Row 59 Residential (\$2.50)	\$		1,961,906	2,379,934	2,371,026	2,386,674	2,398,607	2,410,600	2,422,653	2,434,767	2,446,941	2,459,175	2,471,471	2,483,828	2,496,248	2,508,729	2,521,272	2,533,879	2,546,548	2,559,281	2,572,077
Senior Citizen Residential (\$1.25)	\$		43,604	56,685	58,418	59,625	59,923	60,222	60,523	60,826	61,130	61,436	61,743	62,052	62,362	62,674	62,987	63,302	63,619	63,937	64,256
Secondary																					
Street Light (\$0.20)	\$		119,170	22,639	0	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000
Street Light (\$0.50)																					
Traffic Signal (\$3.00)																					
Traffic Signal (\$9.00)	\$		25,761	30,261	29,916	28,000	28,001	28,002	28,003	28,004	28,005	28,006	28,007	28,008	28,009	28,010	28,011	28,012	28,013	28,014	28,015
Row 60 Traffic Signal (\$15.00)																					
Small Secondary C&I (\$3.50)																					
Medium Secondary C&I (range \$3.51-\$14.99) - based on 0.003 per KWh	\$		775,755	944,747	934,366	935,040	939,715	944,414	949,136	953,882	958,651	963,444	968,262	973,103	977,968	982,858	987,773	992,711	997,675	1,002,663	1,007,677
Large Secondary C&I (\$15.00)																					
Row 61 Primary Metered (\$160.00)	\$		220,763	272,709	274,224	272,640	272,640	272,640	272,640	272,640	272,640	272,640	272,640	272,640	272,640	272,640	272,640	272,640	272,640	272,640	272,640
Row 62 Total Planned Recovery	\$Mill	\$0.0	\$3.1	\$3.7	\$3.7	\$3.9	\$3.9	\$3.9	\$3.9	\$3.9	\$3.9	\$4.0	\$4.0	\$4.0	\$4.0	\$4.0	\$4.0	\$4.1	\$4.1	\$4.1	\$4.1

Notes:
Residential Classes
Rate 1
Rate 21 - Senior Citizen
Street Light Luminarie Classes
[<100 Watt Luminarie (50KWH)]
[>=100 Watt Luminarie (>50 KWH)]
Traffic Signal Classes
[<1250 (913 Active Watts)]
[(914) >1250 to < 5000 (3650)]
[>5000 (>3650 Active Watts)]
Secondary Commercial & Industrial (C&I)
Small C&I [<1168]
Medium C&I [1169 to 5000 KWH]
Large C&I [>5000 KWH]
Primary
[>5001 KWH]